

LOCK WITH A SLIDING BLOCK MOVABLY RECEIVED IN THE CONTROL KNOB TO SELECTIVELY DRIVE THE LATCH

1 BACKGROUND OF THE INVENTION

2 1. Field of the Invention

3 The present invention relates to a lock, and more particularly to a lock
4 with a sliding block movably received in the control knob such that the pivotal
5 movement of the control knob is able to drive the latch to move accordingly.

6 2. Description of Related Art

7 When referring to a lock with a pivotal control knob and a latch driven
8 by the pivotal movement of the control knob, normally, the latch is firmly
9 mounted on the control knob so that when the control knob is pivoted, the latch is
10 driven to rotate in a direction the same as that of the control knob. When the latch
11 is rotated, the latch is able to connect/disconnect to a locking bar which is firmly
12 mounted on a surface to switch between a locking/unlocking status. In general, a
13 wide variety of different elements may be involved to firmly mount the latch on
14 the control knob, which complicates the structure of the lock and hence the
15 manufacture cost is high. Furthermore, the user will need to use the key all the
16 time to switch between locking and unlocking status, which is quite
17 troublesome.

18 To overcome the shortcomings, the present invention tends to provide an
19 improved lock to mitigate and obviate the aforementioned problems.

20 SUMMARY OF THE INVENTION

21 The primary objective of the present invention is to provide an improved
22 lock with a sliding block movably received in the control knob to selectively

1 combine the control knob and the sliding seat so that the latch is able to be driven
2 to complete a temporary locking/unlocking status. Therefore, a key to the lock is
3 unnecessary when a temporary lock/unlocking is required.

4 Another objective of the present invention is to provide first stop on an
5 outer periphery of the sliding seat and a second stop on an inner periphery of the
6 casing to correspond to the first stop such that the engagement between the first
7 stop and the second stop prevent excessive movement of the sliding seat relative
8 to the casing.

9 Other objects, advantages and novel features of the invention will
10 become more apparent from the following detailed description when taken in
11 conjunction with the accompanying drawings.

12 BRIEF DESCRIPTION OF THE DRAWINGS

13 Fig. 1 is an exploded perspective view of the lock of the present
14 invention;

15 Fig. 2 is a schematic cross sectional view showing the assembled lock in
16 Fig. 1;

17 Fig. 3 is a perspective view with partial in cross section to show the lock
18 of the present invention is in a locking status;

19 Fig. 4 is a perspective view with partial in cross section to show the lock
20 of the present invention is in an unlocking status, wherein the sliding block is
21 sandwiched between the control knob and the sliding seat; and

22 Fig. 5 is a s a perspective view with partial in cross section to show the
23 control knob is pivoted to drive the latch to move accordingly when the sliding
24 block is sandwiched between the control knob and the sliding seat.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to Fig 1, the lock in accordance with the present invention has a control knob (10), a sliding block (30), a sliding seat (40), a casing (20), a latch (50) and a plug (60).

The control knob (10) has a keyway (11) centrally defined in the control knob (10) to allow an extension of a key (not shown), multiple locking slits (14) defined through a periphery of the control knob (10) to respectively receive therein a locking plate (12) and a spring (13) and a receiving space (15) defined in a free end face of the control knob (10) to communicate with the keyway (11). However, the principle of the movement of the locking plates (12) and the springs (13) which are received in the corresponding locking slits (14) is well known in the art so that detailed description of how the locking plates (12) are moved according to different situation is thus omitted herein.

The sliding block (30) is a cube, preferably, a hexahedron. At least one expansion spring (31) (two are shown in the embodiment) is provided to the sliding block (30).

The sliding seat (40) has a receiving hole (41) defined to correspond to the sliding block (30), a connection end (42) formed on a free end of the sliding seat (40) and opposite to the place where the receiving hole (41) is defined and a first stop (43) formed on an outer periphery of the sliding seat (40).

Preferably, the receiving space (15) has a shape and a size corresponding to the shape and the size of the sliding block (30) and the shape and the size of the receiving hole (41) so that the sliding block (30) is able to be received in the receiving space (15) which will be further explained in the following description.

1 The casing (20) is a hollow cylinder and has two open ends. Multiple
2 baffle blocks (21) close to one open end are formed on an inner face of the casing
3 (20) and equally spaced apart from each other. A second stop (22) is oppositely
4 formed on the inner face of the casing (20) to correspond to the first stop (43) of
5 the sliding seat (40).

6 The latch (50) has a through hole (51) defined to correspond to the
7 connection end (42) of the sliding seat (40).

8 With reference to Fig. 2, when the lock of the present invention is in
9 assembly, firstly, the sliding block (40) is received in the casing (20) with the
10 connection end (42) extending out of the casing (20) and through the through
11 hole (51) of the latch (50). The plug (60) is then applied to threadingly connected
12 to the connection end (42) to secure the connection among the sliding seat (40),
13 the casing (20) and the latch (50). Thereafter, the sliding block (30) together with
14 the expansion spring (31) is received in the receiving hole (41) of the sliding seat
15 (40) while the control knob (10) with the locking plates (12) and the springs (13)
16 received therein is inserted into the casing (20) to secure the connection
17 therewith. It is notable that after the assembly, the first stop (43) is corresponded
18 to the second stop (22) and the locking plates (12) are limited by the baffle
19 blocks (21).

20 With reference to Fig. 3, after the assembly of the lock of the present
21 invention, the locking plates (12) are limited by the baffle blocks (21) so that
22 there is no relative rotation permitted between the control knob (10) and the
23 casing (20). Similarly, due to the abutment of the distal end face of the control
24 knob (10), the sliding block (30) is forced to be completely received in the

1 receiving hole (41) and thus the expansion spring (31) is compressed between a
2 bottom face defining the receiving hole (41) and a face of the sliding block (30).

3 With reference to Figs. 4 and 5, when a proper key (shown in dashed
4 lines in Fig. 2) is inserted into the keyway (11) of the control knob (10), the
5 locking plates (12) fall into the locking slits (14) to compress the springs (13),
6 which allows the control knob (10) to rotate relative to the casing (20). While the
7 control knob (10) is rotating relative to the casing (20), the receiving space (15)
8 of the control knob (10) aligns with the receiving hole (41) to allow the sliding
9 block (30) to pop out of the receiving hole (41) due to the compressed expansion
10 spring (31). After the sliding block (30) is popped out via the release of the
11 compressed expansion spring (31), the sliding block (30) combines the control
12 knob (10) and the sliding seat (40) which is securely connected to the latch (50).
13 It is noted that during the combination of the control knob (10) and the sliding
14 seat (40), the control knob (10) is rotated such that all the locking plates (12) are
15 kept within the locking slits (14), which allows the control knob (10) together
16 with the sliding seat (40) to rotate relative to the casing (20).

17 Thereafter, the user is able to rotate the control knob (10) to drive the
18 latch (50) to rotate accordingly. Furthermore, when the key is removed, the
19 rotatable movement of the control knob (10) still is able to drive the latch (50) to
20 rotate because the control knob (10) and the sliding block (40) is still combined.
21 Thus, the user is able to complete a temporary locking/unlocking status without
22 the key. Further, in order to avoid excessive rotation of the combination of the
23 control knob (10) and the sliding seat (40) relative to the casing (20), the first
24 stop (43) and the second stop (22) will engage with each other so that the

1 combination of the control knob (10) and the sliding seat (40) can only rotate
2 within a certain range.

3 If the key is inserted into the keyway (11) again to push the sliding block
4 (30) back into the receiving hole (41) of the sliding seat (40) and the control knob
5 (10) is rotated to misalign the receiving space (15) and the receiving hole (41),
6 the rotation of the control knob (10) is no longer possible due to the abutment of
7 the locking plates (12) to the inner periphery of the casing (20).

8 Therefore, the user of the lock of the present invention is able to use the
9 key to complete a permanent locking status or to perform a temporary
10 locking/unlocking status without the key via the alignment of the receiving hole
11 (41) and the receiving space (15).

12 It is to be understood, however, that even though numerous
13 characteristics and advantages of the present invention have been set forth in the
14 foregoing description, together with details of the structure and function of the
15 invention, the disclosure is illustrative only, and changes may be made in detail,
16 especially in matters of shape, size, and arrangement of parts within the
17 principles of the invention to the full extent indicated by the broad general
18 meaning of the terms in which the appended claims are expressed.